

Performance Measures: Episode II “Revenge of the A+ Students”

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Performance Update

■ Since we last met:

- Final Performance Results for FY 2003
- FY03 OMB PART “Scorecard”
 - HEP Response to PART Issues
- Long-term HEP Goals updated
 - Many interactions with community
 - Many concerns
- Next Steps

Annual Performance Results

- These are the final FY2003 results on Annual HEP program targets as reported to DOE CFO and OMB
- We achieved 6 of 8 goals (see following)
 - We have “redesigned” goals for FY 04 and beyond to implement lessons learned
- Cf. FY 2002, where we met 8 of 9 goals

Annual Measures I

- Average unscheduled downtime of the scientific user facilities as a percentage of the total scheduled annual operating time.
 - 2002: < 20% (met goal)
 - 2003: < 20% (met goal)
 - 2004: < 20%
 - 2005: < 15% (under discussion)
- Still needs some work with labs to make definitions consistent

Annual Measures II

- Total integrated amount of data (in pb-1) delivered to the CDF and D-Zero detectors at the Fermilab Tevatron.
 - 2002: 80 (met goal)
 - 2003: 225 (met goal, 240 pb-1 delivered)
 - 2004: 400 (under discussion)
 - 2005: 390 +/- 78 (revised; Lehman review “base” goal with 20% error bar)

Annual Measures III

- Total integrated amount of data (in fb-1) delivered to the BaBar detector at the SLAC B-factory.
 - 2002: 35 (achieved 49 fb-1)
 - 2003: 45 (achieved 40 fb-1)
 - 2004: 50 (under discussion)
 - 2005: 50 +/- 10 (revised)

Other FY 2003 Measures

- There are also 5 other annual measures developed for FY2003 budget that are not in use in later years:
 - Specific Run II improvements
 - Did not meet goal; R&D plan changed
 - Specific B-factory improvements (met goal)
 - Error bar on $\sin(2\beta)$ (met goal)
 - LHC Project completion %'s (met goal)
 - NLC accelerating gradient R&D (met goal)

PART FY2003 Scorecard

- OMB uses Performance Measures to “grade” programs via the Performance Assessment Rating Tool (a.k.a. PART). Includes program planning and mgmt (30% of score) as well as Results (50%)
- HEP FY02 score was 55 (out of 100), lower half of Office of Science. Expect improvement in FY03
 - Main issues: Run II, performance goals, program planning and mgmt

HEP Response to PART concerns

■ Better integration of Performance Measures into program

- Engage community via HEPAP
- Performance Goals in program solicitations
- Improve DOE performance plan

■ Improve Program Planning, Management

- Engage P5 and HEPAP on planning and priority setting
- Committee of Visitors (a la NSF) to validate program management process and outcomes
- Operations Reviews of major user facilities (a la NP)

Long-Term Measures, Redux

- **What OMB Wants:** An objective set of metrics that can be used to evaluate all R&D program outcomes on an “even playing field” to help make budget decisions
- **See my July 2003 HEPAP talk for more details**
- **Since then:**
 - Iterations with HEPAP (Gilman, Langacker, Hitlin, Patterson, Roe)
 - Input from Experiments (CDF, ATLAS, CMS, BaBar, MINOS, CDMS, MiniBooNE)
 - Input from Labs (FNAL, SLAC)
 - Input (solicited and otherwise) from Wise Persons

Concerns

- This is a very difficult exercise to get “right”
- There are a number of possible bad outcomes, intentional and otherwise:
 - Unachieved goals “failure”
 - Achievable goals “lack of ambition”
 - Misinterpretation of Goals as Metrics
 - Many audiences with many different viewpoints
- We will continue to seek HEPAP’s advice
- We are not alone in having concerns

Questions for HEPAP, Redux

- Are goals sufficiently ambitious?
- Are goals sufficiently “deliverable”?
- Are goals representative of program?
- Are we choosing the right metrics?
- Can the long-term goals be adequately reviewed in ~3 years?

Caveats

- The following indicators establish specific long-term (10 year) goals in Scientific Advancement that the HEP program is committed to.
- They do not necessarily represent the research goals of individual experiments in the field.
- These goals correspond very roughly to current research priorities, but are meant to be representative of the program, not comprehensive.
- The definitions of “success” and “minimally effective” for each broad goal establish the metrics by which progress of the field as a whole can be measured
 - “success” ~ quantitative “base” goal (challenging but achievable)
 - “minimally effective” ~ “sub-base” goal (below which lies “failure”)
 - **See handout for definitions**
- Physics may well be different, in which case the definitions will need to be reconsidered.

Long Term Goal I

- **Measure the properties and interactions of the heaviest known particle (the top quark) in order to understand its particular role in the Standard Model**

Long-Term Goal II

- **Discover or rule out the Standard Model Higgs particle, thought to be responsible for generating mass of elementary particles.**

Long-Term Goal III

- **Measure the matter-antimatter asymmetry in many particle decay modes with high precision.**

Long-Term Goal IV

- **Directly discover, or rule out, new particles which could explain the cosmological “dark matter”.**

Long-Term Goal V

- **Determine the pattern of the neutrino masses and the details of their mixing parameters.**

Long-Term Goal VI

- **Confirm the existence of new supersymmetric (SUSY) particles, or rule out the minimal SUSY “Standard Model” of new physics.**

Summary/Next Steps

- DOE and Labs to converge on annual performance goals for FY2004
 - Luminosity is the issue
- DOE/HEP to implement responses to issues raised in OMB PART
 - Performance goal improvement and integration
 - Committee of Visitors, Operations Reviews
- We would like HEPAP to:
 - Continue engagement on long-term goals and metrics
 - Work with other advisory committees to raise issues
 - Review progress on long-term goals in ~ 3 years